

## Does inguinal hernia surgery affect sexual function in men?

Inguinal hernia surgery and sexual function

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### Abstract

**Aim:** It was aimed to reveal the relationship between inguinal hernia surgery and erectile function using an internationally valid, standardized patient questionnaire.

**Material and Methods:** In this retrospective study, data from 133 male patients who underwent the Lichtenstein hernioplasty technique for inguinal hernia surgery were examined. Patients who gave their consent for the study and whose data were available were asked the 5-question IIEF-5 (International Index of Erectile Function) questionnaire to determine their sexual functions preoperatively and at 1, 6, and 12 months postoperatively, and the answers were recorded. Patients' age, body mass index, hernia, type, size, and side were statistically evaluated.

**Results:** IIEF-5 results were revealed to be as follows: 17.26 before surgery, 17.62 in the first month after surgery, 18.02 in the sixth month after surgery, and 18.14 in the twelfth month after surgery. A statistically notable variation was found in the preoperative and postoperative scores of the patients. When the IIEF-5 results of the patients were investigated, it was seen that the results of the patients were boosted after the surgery.

**Discussion:** As a result of inguinal hernia surgery, the swelling in the groin area decreases, cosmetic concerns are eliminated, and pain is reduced, resulting in improved sexual functions.

### Keywords

Inguinal Hernia, Lichtenstein Technique, Erectile Dysfunction, Sexual Functions

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Introduction

Inguinal hernia (IH) surgeries are among the most frequently performed procedures in general surgery clinics. IH surgeries are extremely important because they are anatomically close to the genital area and are a very common operation in general surgery. Nearly 1 million IH surgeries are conducted each year in the United States [1]. The Lichtenstein hernioplasty (LH) technique is a surgery that repairs hernias with mesh and is the most commonly used method [2].

Erectile dysfunction (ED) is a disease that is increasingly seen among male patients today and negatively affects patients both physically and mentally. The definition of sexual dysfunction was defined in 1992 at the National Institutes of Health (NIH) meeting as the incapacity to initiate penile erection required for adequate sexual intercourse for 6 months and the inability to continue. Sexuality is essential in life both psychologically and in the transfer of human genetics. Sexual function can be affected by many factors. One of these factors is surgery [1]. When we look at the studies on IH surgeries in the literature, it is seen that factors that may occur after surgery, such as pain, which is one of the most feared complications, and wound healing problems are examined, but there are few studies examining sexual functions after surgery.

Since IH surgeries are performed in the groin area, where structures significant for sexual function are located, it is substantial to appraise the sexual lives of patients after these surgeries [3, 4].

In IH surgery, the sexual functions of patients may change owing to tissue hardening caused by foreign body reactions due to the Mesh used for tissue repair, cosmetic reasons, and pain due to the incision scar after surgery [5].

In this research, we intended to assess the preoperative and postoperative sexual functions of male patients who underwent surgery with the IH LH technique using the internationally accepted, standardized IIEF-5 score.

Material and Methods

This study is retrospective research conducted by the Departments of General Surgery and Urology of Siirt Education and Research Hospital. The study was conducted using data between November 2023 and November 2024. After obtaining permission for the study, 239 male IH cases who were operated on with the LH and 6x11 cm propylene mesh were retrospectively added to the study. The exclusion requirements for the study were determined as patients who underwent surgery with a different surgical method for inguinal hernia, patients who did not have a sexual partner, patients who had recurrent surgery, people below the age of 20 and above the age of 65, people who did not consent to take part in the research, and people whose data could not be accessed. The study was conducted with 133 patients after excluding 106 patients whose information could not be reached in the pre-surgery and post-surgery first, sixth, and twelfth months and who did not answer the questions.

The International Index of Sexual Function (IIEF) is one of the most commonly used forms developed by Rosen and used today in men presenting with sexual complaints. Patients presenting with complaints of sexual dysfunction are questioned with the IIEF-5 form, a variant of this form. Pre- and post-treatment

evaluations of patients followed up for sexual dysfunction can be made more accurately and reliably with this form. Patients who approved the study were asked the IIEF-5 scoring system form questionnaire by phone pre-surgery and at the first, sixth, and twelfth months post-surgery. This questionnaire consisted of 5 questions. The IIEF-5 questionnaire is divided into five categories: No Erectile Dysfunction (ED) (score 22-25), Mild ED (score 17-21), Mild-Moderate ED (score 12-16), Moderate ED (score 8-11), Severe ED (score 5-7). Age, body mass index, hernia, type, size, and side of the people participating in the research were determined.

Statistical analyses

The statistical analyses of the research were carried out using JASP (Version 0.19.0, University of Amsterdam, Netherlands). The normality assumption was tested with Kolmogorov-Smirnov and Shapiro-Wilk tests. Descriptive statistics of the variables are given as mean, standard deviation, Median (25th-75th percentiles), and frequencies as n (%). The pre-and post-operative International Sexual Function Index (IIEF-5) values of the patients were contrasted using the Wilcoxon Signed Rank Test. P<.05 was regarded as statistically meaningful throughout the study.

Ethical Approval

This study was approved by the Ethics Committee of Siirt University (Date: 2024-12-10, No: 8086).

Results

Data of the people participating in the study are given in Table 1. The average age of the people was 46.16±13.55 years, with a median age of 47.0 (20.0-65.0) years. When the patients were grouped according to the median age, 68(51.1%) of the patients were less than or equal to 47 years old, and 65(48.9%) were older than 47 years old. The mean BMI was 30.73±4.06 kg/m2, the median BMI was 31.1(19.9-37.4). According to the median BMI value, 67(50.4%) of the patients had a BMI value equal to or less than 31.1, and 66(49.6%) had a BMI value greater than 31.1. In 81 (60.9%) of the patients, the hernia was on the right side, in 46 (34.6%) on the left side, and 6 (4.5%) bilateral. The number of patients with direct hernia type was 19 (14.3%), indirect hernia type was 62 (46.6%), and combined hernia type was 52 (39.1%). In 58 (43.6%) of the patients, the hernia size was less than or equal to 2 cm, and in 75 (56.4%) it was greater than 2 cm.

Table 2 shows the IIEF-5 results for the pre-surgery and post-surgery first, sixth, and twelfth months of inguinal hernia surgery and the scores of the five questions on the scale. According to these results, the patients' Q1 (What was your level of confidence in achieving and maintaining erection?) scores increased in the 1st and 6th months post-surgery relative to before surgery. The variation between pre-surgery and post-surgery 1st month, post-surgery 6th month, and post-surgery 12th month is statistically meaningful (p=0.000). The differences between post-surgery 1st month- post-surgery 6th month and post-surgery 1st month- post-surgery 12th month in terms of Q1 are also statistically meaningful (p=0.005). The differences between post-surgery 6th month- and post-surgery 12th month are also not statistically meaningful (p=1.000). When the results of the answers to the question Q2 (When

Table 1. Patient characteristics

| Variables   | Categories | n  | %    |
|-------------|------------|----|------|
| Age (Year)  | ≤47        | 68 | 51.1 |
|             | >47        | 65 | 48.9 |
| BMI (kg/m2) | ≤31.1      | 67 | 50.4 |
|             | >31.1      | 66 | 49.6 |
| Hernia side | Right      | 81 | 60.9 |
|             | Left       | 46 | 34.6 |
|             | Bilateral  | 6  | 4.5  |
| Hernia type | Direct     | 19 | 14.3 |
|             | Indirect   | 62 | 46.6 |
|             | Combined   | 52 | 39.1 |
| Hernia size | ≤2 cm      | 58 | 43.6 |
|             | >2 cm      | 75 | 56.4 |

Table 2. Changes in IIEF-5 scores before and after inguinal hernia repair

| Items | Pre-surgery        | Post-surgery 1. Month | Post-surgery 6. Month | Post-surgery 12. Month | Pre-surgery - Post-surgery 1. Month | Pre-surgery - Post-surgery 6. Month | Pre-surgery - Post-surgery 12. Month | Post-surgery 1. Month- Post-surgery 6. Month | Post-surgery 1. Month- Post-surgery 12. Month | Post-surgery 6. Month- Post-surgery 12. Month |
|-------|--------------------|-----------------------|-----------------------|------------------------|-------------------------------------|-------------------------------------|--------------------------------------|--|---|---|
|       | Mean±sd            | Mean±sd               | Mean±sd               | Mean±sd                |                                     |                                     |                                      |  |   |   |
|       | Median (25th~75th) | Median (25th~75th)    | Median (25th~75th)    | Median (25th~75th)     |                                     |                                     |                                      |  |   |   |
| Q1    | 3.74±1.25          | 3.83±1.22             | 3.89±1.20             | 3.89±1.14              | 0.000                               | 0.000                               | 0.000                                | 0.005  | 0.005   | 1.000   |
|       | 4.0(3.0~5.0)       | 4.0(3.0~5.0)          | 4.0(3.0~5.0)          | 3.0(4.0~5.0)           |                                     |                                     |                                      |  |   |   |
| Q2    | 3.68±1.16          | 3.71±1.16             | 3.80±1.15             | 3.81±1.14              | 0.002                               | 0.000                               | 0.000                                | 0.000  | 0.000   | 0.317   |
|       | 4.0(3.0~5.0)       | 4.0(3.0~5.0)          | 4.0(3.0~5.0)          | 3.0(4.0~4.0)           |                                     |                                     |                                      |  |   |   |
| Q3    | 2.99±1.04          | 3.05±1.01             | 3.11±1.01             | 3.13±1.00              | 0.011                               | 0.000                               | 0.000                                | 0.000  | 0.000   | 0.317   |
|       | 3.0(2.0~4.0)       | 3.0(2.0~4.0)          | 24.0(3.0~4.0)         | 2.0(3.0~4.0)           |                                     |                                     |                                      |  |   |   |
| Q4    | 3.29±1.07          | 3.39±1.01             | 3.50±1.01             | 3.50±1.00              | 0.000                               | 0.000                               | 0.000                                | 0.000  | 0.000   | 0.655   |
|       | 3.0(3.0~4.0)       | 4.0(3.0~4.0)          | 3.0(4.0~4.0)          | 3.0(4.0~4.0)           |                                     |                                     |                                      |  |   |   |
| Q5    | 3.56±0.97          | 3.64±0.93             | 3.73±0.94             | 3.80±0.97              | 0.002                               | 0.000                               | 0.000                                | 0.000  | 0.000   | 0.004   |
|       | 4.0(3.0~4.0)       | 4.0(3.0~5.0)          | 3.0(4.0~4.0)          | 3.0(4.0~5.0)           |                                     |                                     |                                      |  |   |   |
| Total | 17.26±4.98         | 17.62±4.85            | 18.02±4.83            | 18.14±4.91             | 0.000                               | 0.000                               | 0.000                                | 0.000  | 0.000   | 0.007   |
|       | 18.0(14.0~21.0)    | 19.0(14.0~22.0)       | 19.0(15.0~22.0)       | 15.0(19.0~22.0)        |                                     |                                     |                                      |  |   |   |

you achieved an erection with sexual stimulation, how often was this erection sufficient to enter the vagina/reservoir?) were examined, it was found that the patients' scores rose. The difference between the pre-surgery and post-surgery 1st-month scores is statistically meaningful (p=0.002). The difference between pre-surgery - post-surgery 6th month, pre-surgery - post-surgery 12th month, post-surgery 1st month - post-surgery 6th month, post-surgery 1st month - post-surgery 12th month is statistically meaningful (p=0.000). The differences between post-surgery 6th month - and post-surgery 12th month in terms of Q2 are also not statistically meaningful (p=0.317).

When the results of the answers given to question Q3 (How often were you able to maintain the erection you had before intercourse after penetration (vagina/reservoir?)) were compared, it was found that the scores of the patients rose. The difference between the pre-surgery and post-surgery 1st-month scores is statistically meaningful (p=0.011). The difference between pre-surgery - post-surgery 6th month, pre-surgery - post-surgery 12th month, post-surgery 1st month- post-surgery 6th month, post-surgery 1st month - post-surgery 12th month is statistically meaningful (p=0.000). The differences between post-surgery 6th month - and post-

surgery 12th month in terms of Q3 are also not statistically meaningful (p=0.317).

When the results of the answers to question Q4 (How difficult did you have to maintain an erection during sexual intercourse until the end of intercourse?) were examined, it was found that the patients' scores rose. The difference between pre-surgery and post-surgery 1st month, pre-surgery - post-surgery 6th month, pre-surgery - post-surgery 12th month, post-surgery 1st month - post-surgery 6th month, post-surgery 1st month - post-surgery 12th month is statistically meaningful (p=0.000). The differences between post-surgery 6th month - and post-surgery 12th month in terms of Q4 are also not statistically meaningful (p=0.655).

When the results of the answers to the question Q5 (How often did you find your sexual intercourse attempts satisfactory?) were examined, it was found that the patients' scores rose. The difference between the pre-surgery and post-surgery 1st-month scores was statistically meaningful (p=0.002). The difference between pre-surgery - post-surgery 6th month, pre-surgery - post-surgery 12th month, post-surgery 1st month - post-surgery 6th month, post-surgery 1st month - post-surgery 12th month was statistically meaningful (p=0.000). The differences between post-surgery 6th month - and post-

surgery 12th month in terms of Q5 were also statistically significant ( $p=0.004$ ).

When the total scores of the people were examined, it was found that the results of the patients increased after the operation. The difference between pre-surgery and post-surgery 1st month, pre-surgery - post-surgery 6th month, pre-surgery - post-surgery 12th month, post-surgery 1st month - post-surgery 6th month, post-surgery 1st month - post-surgery 12th month is statistically meaningful ( $p=0.000$ ). The differences between post-surgery 6th month - and post-surgery 12th month are also statistically meaningful ( $p=0.007$ ).

## Discussion

Pain caused by IH and the cosmetic appearance of the body due to the hernia may adversely influence sexual functions in patients. In addition, during IH surgeries, important structures such as arterial injury, vein injury, nerve injury, spermatic cord, testicles, and scrotum may be affected, and as a result, sexual functions may be impaired. Patients may develop hematoma, seroma, and orchitis as complications. Irreversible complications may occur due to testicular damage. All these reasons may affect sexual functions [6, 7].

When previous studies in the literature were examined, ED was detected in 95.8% of preoperative patients in the research by Aykanat et al. [8]. In the research by Sonmez et al., it was revealed that 85.1% of the patients had sexual dysfunction [4]. In the research of Ertan et al. and El-awady et al., it was noticed that there was no sexual dysfunction in the patients in the pre-surgery period, but in the postoperative study of Ertan et al., 85.1% and the research of El-awady et al., 90% of the patients reported significant improvement in sexual function [9, 10].

In the literature, Cantay et al. found the erectile function score to be 18.04 preoperatively, 19.53 postoperatively at 1 month, and 21.26 at 6 months postoperatively in their study using the IIEF-15 score [1]. In the research conducted by El-Awady et al. using the IIEF-15 score, the erectile function results of the people were shown to be 20.24 preoperatively, 21.54 in the third postoperative month, and 21.44 in the ninth postoperative month [9]. In the research conducted by Giray et al. using the IIEF-15 score, it was shown to be 18.04 preoperatively, 19.53 in the first month postoperatively, and 21.26 in the sixth month postoperatively [4]. In the research conducted by Tamer et al. using the IIEF-15 score, it was found to be 21.14 preoperatively and 22.85 in the third month postoperatively [10]. The findings in our research are parallel to the studies in the literature, and since it includes fewer questions in the evaluation of erectile function and patients can answer them more easily, IIEF-5 scoring was used, and erectile function results were shown to be 17.26 preoperatively, 17.62 in the first postoperative month, 18.02 in the sixth postoperative month, and 18.14 in the twelfth postoperative month. When the preoperative and postoperative scores were compared, a statistically significant difference was noticed. When the IIEF-5 scores of the patients were examined, it was determined that the results of the postoperative patients increased. The differences between pre-surgery and post-surgery 1st, 6th, and 12th months, post-surgery 1st, 6th, and 12th months, and post-surgery 6th and 12th months were found to be statistically significant.

When the answers given to the questions in the IIEF-5 score were statistically examined, for Q1, the differences between pre-surgery and post-surgery 1st, 6th, and 12th months, post-surgery 1st month and post-surgery 6th and 12th months were found to be statistically significant, while the differences between post-surgery 6th month and post-surgery 12th month were not observed to be statistically significant.

For Q2, the differences between pre-surgery and post-surgery 1st, 6th, and 12th months and post-surgery 1st month and post-surgery 6th and 12th months were statistically meaningful, while the differences between post-surgery 6th month and post-surgery 12th month were not statistically meaningful.

For Q3, the differences between pre-surgery and post-surgery 1st, 6th, and 12th months and post-surgery 1st month and post-surgery 6th and 12th month were statistically meaningful, while the differences between post-surgery 6th month and post-surgery 12th month were not statistically meaningful.

For Q4, the differences between pre-surgery and post-surgery 1st, 6th, and 12th months, post-surgery 1st month, and post-surgery 6th and 12th months were found to be statistically significant, while the differences between post-surgery 6th month and post-surgery 12th month were not observed to be statistically significant.

For Q5, the differences between pre-surgery and post-surgery 1st, 6th, and 12th months and between post-surgery 1st month and post-surgery 6th and 12th months and between post-surgery 6th month and post-surgery 12th month were observed to be statistically significant.

We think that the inclusion criteria for the research were patients of sexually active age and that the exclusion of patients with recurrent hernia from the study may have caused an increase in the scores. When the complications and benefits of IH surgery are examined in the literature, it is seen that the positive results of surgery on sexual functions are more. We think that this is because of the decrease in preoperative pain and the removal of aesthetic issues.

## Limitation

Except for physical disorders, sexual functions can be affected by many psychological, social, and cultural factors. It was not possible to analyze these factors in this study. Patients were contacted retrospectively by phone, and their information was obtained and the answers given during the phone interview may differ from the answers given by the patient alone. The number of patients in the research was not large enough to separately evaluate subgroups of diseases that may cause erectile dysfunction. Therefore, prospective studies with bigger case series are needed to show results with higher levels of scientific findings.

## Conclusion

Even though sexual functions might be affected because of complications that may occur owing to inguinal hernia surgery, IH surgery provides an improvement in sexual functions by eliminating the swelling before the surgery, eliminating the patient's cosmetic concerns, and reducing pain. IH surgery has a positive impact on sexual functions before the surgery.

## Scientific Responsibility Statement

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some*

of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

#### **Animal and Human Rights Statement**

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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#### **Conflict of Interest**

The authors declare that there is no conflict of interest.

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